



**BEFORE THE
PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA**

DIRECT TESTIMONY

OF

JOHN B. LEGLER

ON BEHALF OF

THE DEPARTMENT OF CONSUMER AFFAIRS

CONCERNING

FAIR RATE OF RETURN

JUNE 2001

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1 Q. **PLEASE STATE YOUR NAME AND ADDRESS.**

2 A. John B. Legler, 1040 St. Andrews Court, Bogart, Georgia 30622.

3

4 Q. **WHAT IS YOUR OCCUPATION?**

5 A. Until my retirement in October of 1999, I was a professor of Banking and Finance
6 in the Terry College of Business at the University of Georgia, Athens, Georgia
7 30602. At this time I am a private consultant specializing in utility finance. This
8 testimony represents the opinion of the author. It carries no official endorsement
9 by the University of Georgia.

10

11 Q. **ON WHOSE BEHALF ARE YOU APPEARING?**

12 A. I was retained to represent the Department of Consumer Affairs in this case.

13

14 Q. **WHAT IS YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE?**

15 A. I received my B. A. with Honors in Economics from Allegheny College in 1962, and
16 my M.S. and Ph.D. degrees in Economics from Purdue University in 1965 and 1967,
17 respectively. I was an assistant professor of economics at Washington University,
18 St. Louis, Missouri, where I also served as the Assistant Director of the Institute for
19 Urban and Regional Studies from 1966-1971. I joined the University of Georgia
20 faculty in the Fall of 1971 as an associate professor of banking and finance. From
21 1971 to 1974, I served as administrator of the Research Division in the Institute of
22 Government in addition to my teaching duties in the Department of Banking and

1 Finance. I became Director of the Georgia Economic Forecasting Project on July
2 1, 1974 and served in that capacity until September 15, 1982. I was promoted to
3 full professor in 1977. I have been a consultant to federal, state and local
4 government agencies in Alabama, Arizona, California, Connecticut, Florida,
5 Georgia, Hawaii, Illinois, Kentucky, Louisiana, Maine, Maryland, Massachusetts,
6 Michigan, Mississippi, Missouri, New Jersey, New Mexico, New York, North
7 Carolina, North Dakota, Ohio, Pennsylvania, Rhode Island, South Carolina, Texas,
8 Utah, Virginia and Washington. My consulting has been mainly in areas of
9 economic forecasting, governmental finance, and the cost of capital. I have
10 testified before the House Utilities Study Committee of the Georgia Legislature, the
11 State Board of Equalization in Georgia, the Chatham County (Savannah) Superior
12 Court, and the National Association of Security Dealers.

13
14 My publications include many articles in professional journals, books and
15 monographs. I am a member of Beta Gamma Sigma, a business honorary. I was
16 a research associate of the National Bureau of Economic Research, Inc.

17
18 **Q. HAVE YOU SUBMITTED TESTIMONY IN OTHER HEARINGS BEFORE PUBLIC**
19 **SERVICE COMMISSIONS OR OTHER REGULATORY AGENCIES?**

20 **A.** Yes, I have testified extensively before Commissions on the cost of capital. My
21 participation in hearings before regulatory agencies is indicated in Schedule 1 of
22 Exhibit___(JBL-1). I have testified before the South Carolina Commission on many

occasions in cases involving electric, electric and gas, and telephone companies.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I was retained to review the Company's cost of capital testimony and to prepare a study on which to base an independent estimate of the Company's cost of capital to be presented to the Commission on behalf of the Department of Consumer Affairs.

Q. HAVE YOU REVIEWED THE TESTIMONY ON THE COST OF CAPITAL SUBMITTED BY THE COMPANY?

A. Yes, I have. I have reviewed the testimony of Pauline M. Ahern presented on behalf of the Company.

Q. DO YOU HAVE ANY GENERAL COMMENTS ON THE APPLICATION OF FINANCE THEORY TO THE REGULATORY PROCESS BEFORE DEVELOPING YOUR ESTIMATE OF THE COST OF CAPITAL?

A. It is my opinion that the application of finance theory can provide help and guidance in the decision process, but that the issue of the fair rate of return is still largely judgmental. This is particularly true with respect to the return on equity component of the overall rate of return. Each finance theory suffers from the necessity of making crucial assumptions requiring judgment in the process of its application. Although proponents of any particular theory tend to minimize or even overlook the

1 importance of the necessary assumptions, often the assumptions that are
2 necessarily made are crucial to their results. It is for this reason that I use several
3 methods to estimate the cost of equity capital, using one method to check on the
4 reasonableness of another. In addition, using several methods enables me to
5 estimate a range rather than a single value for the rate of return on equity. I believe
6 that providing the Commission with a zone of reasonableness with respect to the
7 cost of equity capital permits the Commission the flexibility of weighing other factors
8 such as the rate base and capital structure in its decision, with the assurance that
9 the estimate of the cost of capital is within a reasonable range. I believe that,
10 should this Commission adopt my recommendation, the Company would be
11 afforded the opportunity to earn a fair rate of return consistent with the Hope and
12 Bluefield decisions.

13
14 It is also my opinion that reasoned judgment is important at this time because of the
15 volatility in interest rates. The results of mechanical approaches to estimating the
16 cost of equity are likely to change even on a daily basis. While these changes in
17 the calculated cost of equity may be relevant for market investment decisions, I
18 believe that estimating the cost of equity for ratemaking purposes must take a
19 longer term view.

1 **Q. HOW DO YOU PROPOSE TO ORGANIZE YOUR TESTIMONY?**

2 A. My testimony is organized around the specific tasks necessary to estimate the cost
3 of capital. First, I discuss the appropriate capital structure. Next, I discuss the
4 embedded cost rates for senior securities. Next, I estimate the cost of common
5 equity, and last I apply my proposed cost rates to the capital structure thereby
6 arriving at my recommendation regarding the Company's cost of capital.

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A. Obviously, the return on common equity allowed in this proceeding will impact the earnings of the company which in turn will affect retained earnings and ultimately the capital structure. I believe that capital structures should be judged on the basis of their reasonableness and attainability, and utility companies should be given some flexibility in managing their capital structures.

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22

1 Cost of Debt

2 **Q. WHAT IS THE BASIS FOR DETERMINING THE COST OF DEBT?**

3 A. The cost incurred by the company for debt is determined in the capital market at the
4 time the debt is issued. Once issued, the debt becomes, in effect, a contractual
5 arrangement between the company and the creditor. The cost will remain constant
6 during the term of the debt and will not be altered by changes in the company's
7 financial integrity or in general economic conditions. Thus, the cost of debt is the
8 weighted average cost of the company's embedded debt.

9
10 **Q. WHAT RATE DO YOU PROPOSE TO ASSIGN TO LONG-TERM DEBT?**

11 A. Embedded cost rates are easily calculated and usually there is little disagreement
12 among witnesses as to the cost of long-term debt. For purposes of calculating a
13 weighted average cost of capital, I will accept the Company's proposed rate 8.62%.
14 I do note that I have not had an opportunity to review and verify this rate, and see
15 if was calculated in a manner consistent with Commission practice. I recommend
16 that the Company be required to support this calculation.

Cost of Equity

Q. PLEASE DESCRIBE THE METHODS YOU USE IN ESTIMATING THE COST OF EQUITY CAPITAL FOR CAROLINA WATER SERVICE, INC.

A. I have used several applications of finance theory to estimate the cost of equity for Carolina Water Service, Inc. There are several applications of finance theory that may be considered: (1) the Capital Asset Pricing Model (CAPM), (2) the bond yield plus risk premium method, and (3) the dividend yield plus growth or simply the DCF method. The traditional comparable earnings method estimates the rate of return directly by analyzing rates of return on book equity earned by other companies with similar risks. The applications of finance theory rely on data on stock market returns and are considered indirect measures. The ultimate task requires that these returns on market be translated into return on book for regulatory purposes.

Q. ARE THESE THE SAME METHODS YOU HAVE USED IN COST OF CAPITAL TESTIMONY IN YOUR APPEARANCES BEFORE COMMISSIONS?

A. Yes, they are. Over the years I have made certain refinements in my testimony, but the basic methods remain the same. I have expanded my risk premium analysis by adding the Capital Asset Pricing Model approach to estimating risk premiums. Also, despite my reservations about the Capital Asset Pricing Model, as well as recent contributions to the financial literature questioning the use of beta as a measure of risk, its usage and acceptance in rate cases is increasing, and I have made estimates of the cost of equity using it.

Discounted Cash Flow Method

Q. DID YOU USE THE "DIVIDEND YIELD PLUS GROWTH RATE METHOD" TO ASSIST IN ESTIMATING THE COST OF EQUITY FOR CAROLINA WATER SERVICE, INC.

A. Yes, I did.

Q. PLEASE EXPLAIN THE METHOD AND HOW YOU USED IT IN THIS CASE.

A. This method recognizes that investors in stocks expect to receive total returns consisting of dividends and capital gains. Although investors may in fact suffer capital losses, it is reasonable to assume that most investors would not buy a common stock unless there were reasonably good prospects that the stock would increase in value over time. The basic equation used to describe this method, which is commonly known as the DCF method and is widely used in rate of return testimony, is:

$$k = D_1/P_0 + g$$

where,

k = the cost of equity

D_1 = the dividend next period

P_0 = the market price of the stock

g = the expected growth rate.

1 This is a "constant growth model"; and in its simplest form it is assumed that a
2 company has a constant payout ratio and its earnings are expected to grow at a
3 constant rate. Thus, if a stock has a market price of \$30 a share and an expected
4 annual dividend in the coming year of \$3 a share, and if its earnings were expected
5 to grow at 5% a year, then the cost of equity for the company is the 10% dividend
6 yield plus the growth rate of 5% or a total of 15%.

7
8 **Q. DO YOU BELIEVE THAT THE ANNUAL VERSION OF THE DCF MODEL IS**
9 **ADEQUATE FOR MEASURING A UTILITY'S COST OF EQUITY?**

10 **A.** Yes, I do. The annual version of the DCF model typically is criticized for its failure
11 to recognize that dividends are paid on a quarterly basis. In my opinion, it is
12 important to remember the context in which the DCF model is being used.
13 Essentially, the purpose of estimating the cost of equity is to enable the calculation
14 of the revenues required to meet investors' return requirements. The ultimate
15 question is with respect to the adequacy of the revenue dollars to meet those
16 requirements. While it may be argued that reinvestment of quarterly dividends
17 during the year has the effect of raising investors' expected returns compared to the
18 returns produced by the annual version of the model, the reinvestment of earnings
19 during the year also will provide additional compensation to investors. Clearly,
20 dividends are not paid at the end of the year, but neither do ratepayers pay their
21 bills at the end of the year. The irrelevance of the quarterly adjustment is
22 considered in the professional literature in an article by Charles M. Linke and J.

Kenton Zumwalt, "The Irrelevance of Compounding Frequency in Determining a Utility's Cost of Equity," which appeared in Financial Management, Volume 16, Number 3 (Autumn 1987), pages 65-69.

As a practical consideration, the accuracy of a quarterly dividend version of the DCF model depends on the validity of the assumptions made regarding the pattern of dividends and the timing of dividend increases. Obviously, it is invalid to assume that the quarterly dividend is increased each and every quarter. The computationally easy version of the quarterly model makes this assumption. A more rigorous version of the model assumes that the dividend will be increased once a year. If this is the assumption, the quarter in which the dividend is increased relative to the point in time the DCF estimate is calculated is relevant.

Marvin Rosenberg and Ronald N. Lafferty in an article, "The FERC's Discounted Cash Flow: The Right Direction Without Compromise," Public Utilities Fortnightly, February 4, 1988, pages 46-48, demonstrate that the quarterly dividend DCF model equates to the annual version of the DCF model with an adjustment of half the annual dividend growth. That is:

$$k = D_0(1 + .5g)/P_0 + g$$

Thus, if a stock has a market price of \$30 a share and if the last annual dividend paid was \$3 a share, and if its earnings were expected to grow at 5% a year, then the cost of equity for the company is an adjusted dividend yield of 10.25% plus the

1 growth rate of 5% or a total of 15.25%. As I understand the testimony of the
2 Company's cost of capital witness, this is how she adjusted the dividend yield
3 component of her DCF analysis.

4
5 Based on these considerations, I believe that the annual version of the DCF model
6 is adequate for the purposes it is intended and the context in which it is used.

7
8 **Q. DO YOU BELIEVE THAT THE CONSTANT GROWTH VERSION OF THE DCF**
9 **MODEL IS ADEQUATE FOR PURPOSES OF ESTIMATING THE COST OF**
10 **EQUITY?**

11 A. Yes, I do, but certainly the results must be used with judgment in setting the cost
12 of equity. The constant growth version of the model assumes that a company's
13 dividends, earnings, book value and stock price increase at the same constant rate.
14 I agree that dividends, earnings, and stock prices are not likely to grow at the same
15 rate as required by the model. Indeed, the model can be modified to incorporate
16 more than one growth rate. But this certainly adds to the mathematical complexity
17 of the model and further complicates an already complicated process of selecting
18 the growth rate.

19
20 I believe that it is important to consider what version of the model is likely to be
21 used by investors themselves, not what another witness or I believe to be more
22 acceptable. In this regard, I doubt that the average investor has the ability or

1 inclination to attempt the mathematics required by the multiple growth version of the
2 model. Under this version of the model it is relatively easy to determine the
3 reasons for the differences in results among the witnesses.

4
5 **Q. HOW HAVE YOU APPLIED THE DCF MODEL IN THIS CASE?**

6 A. I applied the DCF model to a group of reasonably comparable water utilities
7 followed by Value Line.

8
9 **Q. HOW DID YOU SELECT THE GROUP OF WATER UTILITIES?**

10 A. The group was selected from the water utilities followed by Value Line. These were
11 the companies comprising the water industry in Value Line's Standard edition.
12 There were four companies in this edition.

13
14 **Q. PLEASE CONTINUE WITH YOUR DISCUSSION OF THE DCF METHOD.**

15 A. The most difficult aspect of implementing the DCF method is estimating the future
16 growth rate. If a company's past trend in growth has been erratic, it is difficult to
17 project future growth on the basis of past trends. Since the DCF method requires
18 a constant or sustainable growth rate, it is apparent that growth rates based upon
19 recent realized rates are too volatile to provide a basis for future projections for
20 most utilities.

1 **Q. ARE THERE OTHER METHODS OF FORECASTING GROWTH RATES?**

2 A. Another method used by security analysts is to estimate future growth based on the
3 percentage of retained earnings and the rate of return on book equity. Quite
4 simply, if we call the percentage of earnings retained (b), and multiply it by the rate
5 of return on equity (R), the estimate of future growth (g) is: $g = b \times R$. For example,
6 if a company earns 10% on equity, but pays all the earnings out in dividends, the
7 "plowback" factor will be zero and earnings per share will not grow. Conversely, if
8 the company retains all of its earnings and pays no dividend, it would grow at an
9 annual rate of 10%.

10
11 **Q. DOES THIS PROCEDURE FOR ESTIMATING FUTURE GROWTH REQUIRE ANY**
12 **ASSUMPTIONS?**

13 A. Three assumptions must hold for the procedure to produce an accurate (exactly
14 correct) estimate:

- 15 1. The rate of return on equity is constant over time;
- 16 2. The percentage of retained earnings is constant over time;
- 17 3. The company sells no new common stock or sells it only at book.

18
19 While these assumptions have not held in the past for most utilities in general, it is
20 the future, not the past, that is relevant. Also, while year to year fluctuations in the
21 variables may be expected, the average return on equity and retention rate over
22 time may be expected to be reasonably stable.

1 If a company were to sell common equity at above book value, proceeds from the
2 sale possibly could be used to support a somewhat higher growth rate than
3 suggested by the basic equation. Since most utility stocks are now selling well
4 above book value this is more of a consideration than when utility stocks were
5 selling below book value. For this reason, I do not believe exclusive reliance
6 should be placed on this method of estimating the dividend growth rate at this time.

7
8 In my opinion the retention growth rate method provides a useful check on the
9 sustainability of adopted growth rates. For any particular growth rate, the
10 combinations of retention rates and returns on equity necessary to produce that
11 growth rate can be determined. For example, we can see from the table below that
12 for a growth rate of 6%, with retention rates of 25% to 40%, returns on equity from
13 15.0% to 24.0% must be sustainable.

<u>Retention Rate x Return on Equity = Growth Rate</u>		
25%	24.0%	6.0%
30	20.0	6.0
35	17.1	6.0
40	15.0	6.0

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20 In my opinion these returns and retention rates are unlikely on a sustainable basis.
21 Accordingly, the acceptability of a 6.0% or higher growth rate in DCF calculations
22 is questionable, and I believe even my estimates for individual companies reflecting
23 growth rates above this level should be viewed with some skepticism.

1 **Q. HAVE YOU APPLIED THIS TECHNIQUE TO THE GROUP OF COMPARABLE**
2 **WATER UTILITIES?**

3 A. Despite its limitations, it is still useful and I have applied it in this case. To apply
4 it, we need two numbers, a company's expected retention rate and an estimate of
5 its future return on common equity. Value Line forecasts a longer-term (2004-2006)
6 earnings and dividend estimate for each company in the standard edition. For
7 these companies Value Line also forecasts a longer-term (2004-2006) return on
8 common equity for each company. I have used these Value Line projections to
9 calculate the retention growth for each company in the group of comparables
10 followed in the Standard edition. In applying the formula, I have increased Value
11 Line's return on equity by 0.5% to reflect conversion from a year end to an average
12 year basis.

13
14 **Q. HAVE YOU EMPLOYED ANY OTHER GROWTH RATES IN YOUR DCF**
15 **ANALYSES?**

16 A. Yes, I have also made DCF estimates based on Value Line's direct dividends and
17 earnings forecasted growth rates.

18
19 **Q. WHAT PRICES WILL YOU ADOPT FOR PURPOSES OF YOUR DCF**
20 **ESTIMATES?**

21 A. The price of a stock is likely to fluctuate from day to day because of market
22 conditions and factors such as dividend payments. In my opinion, in applying the

1 DCF method to a single company, it would be appropriate to use the average price
2 of the Company's stock over a period of time rather than the price on a particular
3 day. The time period is admittedly judgmental, but it is my opinion that it is still
4 better than a spot price. The use of a spot price in a situation where there are wide
5 swings in the stock market over relatively short periods of time makes the resulting
6 DCF calculation very much dependent upon the particular day chosen to perform
7 the analysis. While the most recent stock price may be quite relevant for market
8 investment decisions based on DCF calculations, I believe the use of the DCF
9 method for ratemaking purposes must take a longer term view.

10
11 I have consistently used three month average prices in my DCF analysis in
12 testimony. I have also provided estimates using the closing prices on the last day
13 of the three month period. I will continue my practice in this case. I believe that
14 these prices are reflective of current market conditions while the average price
15 smooths out day to day fluctuations. The current time period in this testimony is
16 March through May 2001.

17
18 **Q. WHAT DIVIDENDS DO YOU ADOPT FOR PURPOSES OF THE DCF**
19 **CALCULATION?**

20 A. Conceptually, the appropriate dividend is the expected dividend for the coming
21 year. Defined as D_1 , it is equal to the current dividend times 1 plus the growth rate
22 [$D_1 = D_0(1+g)$]. I believe the straight forward calculation suggested above reflects

1 a reasonable approach to estimating the dividend for the coming year for the group
2 of companies used in the DCF analysis.

3
4 **Q. WHAT COST OF EQUITY DID YOUR DCF ANALYSIS PRODUCE FOR THE**
5 **GROUP OF COMPARABLE WATER COMPANIES?**

6 A. The results are shown on Schedule 3 of Exhibit ____ (JBL-1). For the water
7 companies, the projected dividend yield based on retention growth and average
8 prices was 3.79%. Retention growth averaged 6.15% resulting in an average
9 expected return on common equity of 9.94%. Based on Value Line's direct dividend
10 growth rate forecast, the average expected dividend was 3.67% resulting in an
11 average expected return on equity of 6.67%. Based on Value Line's direct earnings
12 forecast, the average expected earnings growth rate was 6.88% resulting in an
13 average expected return on equity of 10.69%. The expected returns based on May
14 31, 2001 stock prices are 10.00%, 6.74% and 10.76%, respectively.

15
16 **Q. DO YOU BELIEVE THAT THESE AVERAGE EXPECTED RETURNS ON**
17 **COMMON EQUITY ARE APPROPRIATE FOR CAROLINA WATER SERVICE?**

18 A. I would not recommend this approach for estimating the expected return on equity
19 to any individual company without examining the factors influencing a particular
20 company. I do believe, however, that the averages are useful in forming a judgment
21 about the Company's cost of equity. Although the companies are similar in certain
22 respects, we would expect there to be some differences in perceived riskiness of

1 the individual companies, and accordingly, would expect some variation in the
2 estimated cost of equity by company.

3
4 **Q. HAVE YOU EXAMINED THE RELATIVE RISKINESS OF CAROLINA WATER**
5 **SERVICE IN COMPARISON TO THE GROUP OF COMPARABLE WATER**
6 **COMPANIES?**

7 A. Yes, I have. Risk differences may be divided into financial risk and business risk.
8 Financial risk, as I am sure this commission is aware, is concerned with the
9 proportion of debt in a company's capital structure. The higher the proportion of
10 debt, or conversely the lower the proportion of common equity, the greater the
11 financial risk. As shown in Schedule 2, the average common equity ratio for the
12 groups of water companies followed by Value Line was estimated at 46.88%
13 (Standard Edition) for 2001. By comparison Carolina Water Service's equity ratio
14 requested in this case is 49.91%. I believe that Carolina Water Service is
15 reasonably comparable, perhaps somewhat less risky, in comparison to the
16 financial risk of the group of water companies.

17
18 Business risk in a formal sense is defined as the uncertainty involved in the
19 projections of future operating income. Many things can affect business risk and
20 in the case of a utility, the size and economic base of a company's territory certainly
21 would be one. General risk indicators for the water companies are shown on
22 Schedule 4 of Exhibit ____ (JBL-1). These measures are Value Line's beta, Safety

1 Ranking, Financial Strength Rating and Price Stability Index. Unfortunately, Value
2 Line does not follow Carolina Water Service or its parent since its stock is not
3 publicly traded and similar measures are not available. I have no reason to believe
4 that the group, on average, does not approximate the riskiness of Carolina Water,
5 and this group was used by the Company's own cost of capital witness, Ms. Ahern.

Risk Premium Method

**Q. DID YOU USE THE "BOND YIELD PLUS RISK PREMIUM METHOD" TO ASSIST
IN THE PREPARATION OF THE ESTIMATED COST OF EQUITY CAPITAL?**

A. In virtually all the cases in which I have testified on the cost of capital I have utilized this method. Because of the volatile conditions in the bond market, there are problems with this method and its application in the traditional manner often used by analysts. I will discuss this method, the problems associated with it and why, at the present time, I do not believe exclusive reliance should be placed upon it for estimating the cost of equity. I do believe, however, that the Commission should give it consideration in setting the cost of equity. All methods suffer from the necessity of making assumptions and judgments in their application. The risk premium method is not an exception.

**Q. WHAT CONCLUSIONS HAVE YOU REACHED REGARDING THE RISK
PREMIUM APPROACH?**

A. I believe it should be used with care and be reflective of current conditions. Therefore, I believe it should not stand on its own but be used in conjunction with other estimating techniques.

Q. WHAT IS THE THEORETICAL BASIS OF THE BOND YIELD PLUS RISK PREMIUM METHOD?

A. Basically, the theory suggests that the required rate of return is higher for riskier securities than less risky securities. Thus, normally we would expect that corporate bonds would carry a higher cost than U.S. Government securities. Accordingly, corporate equity securities would have a higher return than its debt. The theory usually is implemented by adding a risk premium to the yield on a company's long-term debt or utility bonds of the same rating. The yield on the company's long-term debt would be established by market conditions; and relative riskiness of a company's bonds, basically, is assessed by bond ratings. Alternatively, a risk premium may be developed relative to a risk-free U.S. Government security and the cost of equity estimated by applying that risk premium to the currently prevailing rate on the government security.

Q. IS A COMMON EQUITY INVESTMENT IN A PUBLIC UTILITY INVARIABLY MORE RISKY THAN AN INVESTMENT IN THE DEBT OF A PUBLIC UTILITY?

A. Circumstances may exist such that a negative risk premium or well below average risk premium may be calculated. The conventional approach states that equity is more risky than debt because the equity holder stands last in line as a claimant on the earnings of a corporation. Bonds represent a long-term commitment at a fixed interest rate. The return on common equity is not fixed at the time of purchase and will change in response to changing financial and economic conditions. Thus, in

1 the case of a regulated industry, the return on common equity may be adjusted to
2 reflect current money cost more than likely with some lag. In the case of the
3 bondholder, however, no adjustment in the interest rate takes place after the bond
4 is issued. If the bondholder did not correctly anticipate future rates of inflation at
5 the time of purchase, the transaction may turn out to be a poor investment despite
6 the fact that interest payments continue and the principal is repaid at maturity.

7
8 This additional risk is called interest-rate risk. It has nothing to do with the financial
9 condition of the company issuing bonds and can only be protected against by
10 demanding a higher interest rate when the bond is issued. In my opinion, this is
11 one important reason for the high interest rates experienced during the 1980s,
12 despite substantial slowing in the rate of inflation. Investors recognize that interest
13 rate risk is important and have demanded higher interest rates as protection against
14 a possible future decline in economic conditions.

15
16 As a practical consideration bondholders have suffered low returns on public utility
17 bonds for several decades despite the industry's good record of interest and
18 principal payments. In my opinion, the perception that interest-rate risk is important
19 has increased the relative riskiness of debt compared to equity.

1 **Q. IS THE EXISTENCE OF A NEGATIVE RISK PREMIUM CRUCIAL TO YOUR**
2 **REJECTION OF THE RISK PREMIUM METHOD AS THE PRIMARY METHOD OF**
3 **ESTIMATING THE COST OF EQUITY IN A RATE CASE.**

4 A. No, it is not. The point of my risk premium discussion and presentation of data is
5 not to establish a negative risk premium. My point is that the method as
6 conventionally applied in rate cases may produce an unreliable estimate of the cost
7 of equity. The conventional approach adds an average long-term risk premium
8 calculated in a variety of ways to a current bond yield to arrive at a cost of equity.
9 Implicitly, this assumes that the risk premium is constant. My analysis raises
10 serious doubts about the validity of this assumption, and consequently, the
11 usefulness of the method.

12
13 I do not disagree with the basic finance theory which indicates that investors expect
14 higher returns on riskier investments. I do believe, however, that contemporary
15 institutional market factors affecting relative risk should not be ignored for the sake
16 of the simplicity found in historical relationships.

17
18 **Q. DESPITE YOUR RESERVATIONS ABOUT THIS METHOD, HAVE YOU DONE**
19 **ANY STUDIES OF RISK PREMIUMS FOR CAROLINA WATER SERVICE OR THE**
20 **GROUP OF COMPARABLE WATER COMPANIES?**

21 A. Yes, I have prepared a study for a group of water companies. This study was
22 originally prepared for my testimony in a case involving Southern California Water.

1 Since I was retained only recently in this case, it was not possible for me to
2 prepared a new study. I have developed risk premiums based on a discounted
3 cash flow approach. For the DCF based approach, I based the necessary growth
4 rate on Value Line's projected data for dividends per share, earnings per share and
5 return on equity from its published reports on the companies towards the end of
6 each year. The companies included in this group of water companies are American
7 Water Works, Aquarion Company, California Water Service Group, Consumers
8 Water, Philadelphia Suburban Corp. and United Water Resources, Inc.
9 Unfortunately, Value Line data for this group only goes back to 1988. In the early
10 years of this period, several predecessor companies were involved and mergers
11 have taken place. The Hydraulic Co. became Aquarion, GWC became United
12 Water, and Consumers Water has merged with Philadelphia Suburban. American
13 Water and United were covered with the midwestern electrics in the early years of
14 the study period, and California Water was covered with the western electrics. The
15 average values for the required variables are shown in Schedule 5. In addition, I
16 performed the same analysis using Value Line's direct forecasted dividend and
17 earnings growth rates from those same reports. A fourth set of risk premiums were
18 calculated using the Capital Asset Pricing Model. Thus, my risk premiums
19 estimates are based on four estimates of the returns on common equity.

Q. WHAT RISK PREMIUMS DOES YOUR ANALYSIS INDICATE FOR THE GROUP OF WATER COMPANIES?

A. The results of my study are shown in schedules 6 and 7. The exhibits may be viewed in the following way: an estimate of the cost of equity for group of water companies is made for the first of January of each year. It is then compared to the existing bond yield at the time which I have assumed to be the reported December Moody's public utility bond yield of the single-A rating class of the previous year. Alternatively, the expected return is compared with the 30-year Treasury bond rate for December of the previous year. The expected risk premium is the difference between the DCF calculated return on equity and the then current bond yield, whether it is based on the Treasury or utility bond rate. The risk premiums are summarized below.

	Based on Treasury Rate: <u>1989-1999</u>	Based on Utility Rate: <u>1989-1999</u>
Return based on:		
Retention Growth	2.37%	1.46%
Value Line Dividend Growth	2.78%	1.69%
Value Line Earnings Growth	4.30%	3.20%
CAPM	4.75%	3.65%
Average	3.55%	2.50%

The calculated expected risk premium for water companies has averaged 2.50% relative to the utility bond rate and has averaged 3.55% relative to the Treasury bond rate for the period from 1989 to 1999 based on the four estimates of the returns on equity. In calculating these average risk premiums, all negative risk premiums for individual years have been deleted.

1 The current yield on 30-Year Treasury bonds is approximately 5.7%. The current
2 yield on Moody's single-A rated public utility debt is approximately 7.8% (7.83% as
3 of May 16, 2001). Thus adding the average risk premiums for the 1989-1999 time
4 period to current yields produces a required return in a range from 9.25% to
5 10.30%.

6 Longer-term Risk Premiums

7 $5.7\% + 3.55\% = 9.25\%$

8 $7.8\% + 2.50\% = 10.30\%$

Capital Asset Pricing Model

Q. DID YOU USE THE CAPITAL ASSET PRICING MODEL (CAPM) TO ESTIMATE THE COST OF EQUITY TO CAROLINA WATER SERVICE, INC.?

A. I consider the CAPM to be a subset of the risk premium approach. As with all the methods we use, assumptions are required in its application. There are fairly severe problems with the required data inputs usually employed by analysts using this method. This results in internal inconsistencies which I discuss below. For this reason I usually have preferred not to use this method in my testimony. Since the method has grown in popularity, I believe a comment on the use of this model is appropriate. I have also provided estimates of the cost of equity based on it.

Q. CAN YOU BRIEFLY DESCRIBE THE CAPITAL ASSET PRICING MODEL?

A. Very briefly, the model states that the cost of equity to a company is equal to a risk-free rate, usually approximated by the yield on a government security, plus a risk adjusted premium for equity compared to the risk-free rate. The risk adjustment factor is called beta, which is a measure of the relative volatility of the stock in question to the volatility of the market. The equation used to estimate the cost of equity is:

$$k_j = k_{rf} + \beta(k_m - k_{rf})$$

where, k_j is the return on the stock

k_{rf} is the risk-free rate

β is beta

k_m is the return on the market

1 Q. WOULD YOU BE MORE SPECIFIC ABOUT THE INTERNAL
2 INCONSISTENCIES?

3 A. Yes, I will. The Value Line betas are commonly used in the implementation of the
4 capital asset pricing model. The Value Line beta is an adjusted beta and the New
5 York Stock Exchange Composite Index is used in its construction as a surrogate for
6 the market. A long-term (1926-2000) historical market premium provided by
7 Ibbotson Associates is often used as the surrogate for the expected market
8 premium. The surrogate for the market in the Ibbotson study is the S&P 500. To
9 the extent that the surrogate for the market and the estimating technique affect the
10 beta, the estimated return will be affected. This may not be of great concern, but
11 the use of an adjusted beta compared to a raw beta certainly affects the return
12 substantially. The Value Line betas "are adjusted for their long-term tendency to
13 converge towards 1.00." (Arnold Bernhard, How To Use the Value Line Investment
14 Survey, page 61) The actual adjustment procedure involves the application of a
15 regression equation which may be closely approximated by averaging the raw beta
16 with 1.0 giving twice the weight to the raw beta. All stocks are adjusted in the same
17 manner and also they are rounded to .00 or .05.

18
19 While the adjustment procedure may be appropriate for the construction of a risk
20 indicator, the theoretical linkage between the adjusted beta and the CAPM model
21 is tenuous, at best. I know of no recent empirical tests which indicate that the beta
22 of all stocks converge towards 1.0 or even that utility stocks converge the same way

1 as other stocks. The CAPM, unlike the DCF, is a one period model. Thus, even if
2 a forward looking beta is appropriate, the adjustment to the raw beta is too large to
3 be realized in the near term.

4
5 Furthermore, I also should note that the beta is estimated relative to a risk-free rate.
6 The estimated beta will vary depending upon whether a short-term or long-term
7 government security rate is used as the proxy for the risk-free rate. There has been
8 growing support among analysts for the use of a long-term government security rate
9 as a proxy for the risk-free rate when using the CAPM in regulatory proceedings.
10 However, it is possible that the beta was estimated relative to a different risk-free
11 rate or no risk-free rate at all. The market premium is often based on the long-term
12 historical spread between realized market returns and risk-free rates.

13
14 The Ibbotson study covering a very long time period beginning in 1926 often is
15 used in developing this estimate. That long-term risk premium through 1999 is
16 8.1% based on the difference in the arithmetic returns on common stock and the
17 income returns on long-term government bonds.

18
19 **Q. DESPITE YOUR RESERVATIONS HAVE YOU CALCULATED THE COST OF**
20 **EQUITY FOR CAROLINA WATER SERVICE OR THE GROUPS OF**
21 **REASONABLY COMPARABLE WATER COMPANIES USING THE CAPITAL**
22 **ASSET PRICING MODEL?**

1 A. I have calculated the cost of equity for the groups of reasonably comparable water
2 utilities. I have used the current yield on 30-year Treasury bonds as the risk-free
3 rate. Consistent with my risk premium estimates, I will use a rate of 5.7%. I will
4 also use the historical risk premium of 8.1% in my analysis. I have made the
5 calculations using both S&P and Value Line betas. The average S&P beta for the
6 group of water utilities is .26 (excluding negative values). The average Value Line
7 beta for the entire group of water utilities .54. The betas are shown in Schedule 9
8 of Exhibit____(JBL-1). Based on the long-term historical market risk premium of
9 8.1% and a risk-free rate of 5.7% for 30-year Treasury bonds, the CAPM estimated
10 return is in a range from 7.81% to 10.07% for the entire sample of water utilities; in
11 a range from 8.37% to 10.64% for the companies covered in the Standard Value
12 Line Edition; and in a range from 6.67% to 9.43% for the companies covered in the
13 Expanded Value Line Edition.

14 Entire Sample of Water Utilities:

15 $5.7\% + .26(8.1\%) = 7.81\%$

16 $5.7\% + .54(8.1\%) = 10.07\%$

17 Value Line Standard Edition Companies:

18 $5.7\% + .33(8.1\%) = 8.37\%$

19 $5.7\% + .61(8.1\%) = 10.64\%$

20 Value Line Expanded Edition Companies:

21 $5.7\% + .12(8.1\%) = 6.67\%$

22 $5.7\% + .46(8.1\%) = 9.43\%$

Comparable Earnings

Q. YOU STATED THAT THE COMPARABLE EARNINGS APPROACH IS ONE METHOD OF ESTIMATING THE COST OF EQUITY CAPITAL. PLEASE EXPLAIN THE BASIS OF THIS APPROACH.

A. The basis of the comparable earnings approach is the often cited case of the Federal Power Commission vs. Hope Natural Gas Company (1944). Briefly, two principles are involved in the comparable earnings approach as applied to ratemaking. One states that an investor should be able to earn a return comparable to the returns available on alternative investments with similar risks. The other principle states that the return should be sufficient to enable the utility to attract additional equity capital required on a reasonable basis and maintain the financial integrity of the firm. Basically, the comparable earnings test is what economists refer to as the opportunity cost principle.

Q. WHAT PROBLEMS ARE INHERENT IN THE COMPARABLE EARNINGS APPROACH?

A. The major problem in applying the comparable earnings approach is the difficulty in determining what companies are comparable to the utility in question. Some analysts suggest that the valid comparison is with a broad sample of unregulated firms such as the S&P 500. Other analysts select groups of specific firms of comparable risk based upon criteria such as similar beta coefficients, and standard deviations of returns. In short, the problem is not so much the concept, but its

1 implementation. In fact, it is these problems and the fact that the method is
2 backward looking rather than forward looking which, at least in part, have led to the
3 application of finance theory such as the DCF method in utility rate cases.
4

5 **Q. DR. LEGLER, DO YOU BELIEVE THAT UTILITIES AND INDUSTRIALS ARE**
6 **COMPARABLE?**

7 A. In addition to the protection afforded by regulation to utilities, there are accounting
8 differences in the measurement of returns which call into question strict
9 comparability between utilities and industrials.
10

11 There is also a problem comparing utilities and industrials when there is a
12 significant disparity in the market to book values. An illustration should make this
13 point clear. If an industrial stock is selling to two times its book value, and earning
14 20% per year on book value, it would be erroneous to suggest that a new or
15 prospective investor would receive a return of 20% on his or her investment. Thus,
16 comparing book returns of utilities selling closer to book to the book returns of
17 industrials selling well above book is an invalid comparison. This is not to suggest,
18 however, that the investor could not receive a market return of 20% on one or both
19 investments.
20
21
22

1 Q. WHAT CONCLUSION HAVE YOU REACHED REGARDING THE COMPARABLE
2 EARNINGS APPROACH USING INDUSTRIALS AS THE ONLY STANDARD OF
3 COMPARISON?

4 A. I reject the application of the comparable earnings approach using industrials as the
5 only basis of comparison, in principle, because of the questionable comparability
6 of the measured earnings and differences in risks of regulated and unregulated
7 companies.

8
9 Q. HAVE YOU PERFORMED ANY OTHER COMPARABLE EARNINGS ANALYSIS?

10 A. Not in a strict sense, because my DCF analysis for the group of water companies
11 has the attributes of a forward looking comparable earnings analysis since it is a
12 market based approach. The cost of equity for a group of comparable companies,
13 or a risk adjusted cost of equity for a group of reasonably similar companies, if
14 awarded to Carolina Water Service conforms to the Hope and Bluefield standards.
15 Consequently, my DCF analysis parallels the traditional approach and leads to the
16 same conclusion.

17
18 Q. BY LIMITING THE STUDY TO OTHER WATER COMPANIES AREN'T YOU
19 INVOLVING CIRCULARITY IN YOUR REASONING?

20 A. No, I don't believe so. If all commissions set allowed returns on the basis of what
21 other companies were expected to earn or have earned, circularity of reasoning
22 would be a problem. By using a market based approach, it is assumed that the

1 market accounts for differences in risk among companies and among industries in
2 setting stock prices.

3
4 **Q. HAVE YOU APPLIED ANY OTHER TESTS OF REASONABLENESS OF A**
5 **COMPARATIVE NATURE TO YOUR ESTIMATES BASED ON FINANCIAL**
6 **MODELS?**

7 A. Yes, I have. I have provided the Value Line projected returns on book equity for the
8 group of water companies in Schedule 10. These projected returns indicate returns
9 somewhat above those produced by the market based approaches in most cases.
10 While I believe that they provide little information on what reasonable allowed
11 returns should be at the present time, in the interests of completeness, I am
12 providing them. For the Value Line sample of water companies, the projected
13 returns average 10.13% for 2000, 10.50% 2001, and 11.25% for 2002.

Cost of Equity Summary

Q. PLEASE SUMMARIZE YOUR ANALYSIS OF THE COST OF COMMON EQUITY TO CAROLINA WATER SERVICE.

A. I have placed reliance on the discounted cash flow method, the risk premium method, and the Capital Asset Pricing Model. I have applied the DCF method to a group of water companies followed by Value Line. I applied the risk premium method to a group of water companies followed by Value Line between 1988 and 1998. I applied the Capital Asset Pricing Model to the groups of Value Line water companies followed in both the standard and expanded editions. The results of my applications of these financial models are summarized below.

<u>DCF Method:</u>	<u>Based on:</u>		
	<u>Average Prices</u>		<u>Current Prices</u>
Retention Growth	9.94%		10.00%
Value Line Dividend Growth	6.67%		6.74%
Value Line Earnings Growth	10.69%		10.76%
<u>Risk Premium Method</u>		9.25%-10.30%	
<u>Capital Asset Pricing Model:</u>			
Entire Sample		7.81%-10.08%	
Value Line Standard Edition Companies		8.37%-10.64%	
Value Line Expanded Edition Companies		6.67%- 9.43%	
<u>Comparable Earnings:</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>
	10.13%	10.50%	11.25%

1 I believe that the cost of equity lies in a range from 10.0% to 11.0%. The upper end
2 of the risk premium and upper end of the CAPM results fall within this range. For
3 purposes of calculating a weighted average cost of capital, I will use the midpoint
4 of this range, 10.5%.

1 WEIGHTED AVERAGE COST OF CAPITAL

2 **Q. HAVING ASSIGNED COST RATES TO THE CAPITAL COMPONENTS AND**
3 **ADOPTED A CAPITAL STRUCTURE, WHAT WEIGHTED AVERAGE COST OF**
4 **CAPITAL DO YOU RECOMMEND?**

5 **A.** I have calculated the weighted average cost of capital based on the Company
6 proposed capital structure and embedded cost rate for long-term debt, and a return
7 on common equity of 10.5%. I recommend an average cost of capital to Carolina
8 Water Service, Inc. 9.56%. These calculations are shown in Schedule 11 of
9 Exhibit____(JBL-1).

10
11 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

12 **A.** Yes, it does.

Exhibit____(JBL-1)

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3	2	DCF Analysis: Water Utilities
4	1	Water Companies: Risk Indicators
5	1	Water Companies: Projected Growth Rates
6	4	Water Companies: Historical DCF Analysis
7	4	Water Companies: Expected Risk Premiums, 1989-1999
8	6	Moody's Public Utility Bond Yields
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10	1	Water Companies: Projected Rates of Return
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Regulatory Participation of John B. Legler

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ALLTEL Companies of Georgia	GPSC 6746-U	07/96
Pacific Gas & Electric	CPUC 96-05-022	09/96
San Diego Gas & Electric	CPUC 96-05-043	09/96
Southern California Edison	CPUC 96-05-023	09/96
Southern California Gas Company	CPUC 96-05-024	09/96
Baltimore Gas & Electric	PSCM 8725	11/96
PECO Energy Company	PPUC R-00973953	08/97
Pacific Gas & Electric	CPUC 97-05-016	09/97
BellSouth Telecommunications (GA)	GPSC 7061-U	09/97
BellSouth Telecommunications (SC)	SCPSC 97-374-C	12/97
BellSouth Telecommunications (SC)	SCPSC 97-239-C	3/98
South Carolina Pipeline Corp.	SCPSC 90-588-G	5/98
Atlanta Gas Light	GPSC 8390-U	5/98
Pacific Gas & Electric	CPUC 98-05-021	09/98
San Diego Gas & Electric	CPUC 98-05-019	09/98
Southern California Edison	CPUC 98-05-024	09/98
Georgia Power Company	GPSC 9355-U	10/98
Black Mountain Gas Company (AZ)(a)	G-03493A-98-0705	06/99
BellSouth Telecommunications (GA)	GPSC 10692-U	07/99
Southern California Water Company	CPUC 99-03-068	08/99
PacifiCorp (UT)	PSCU 99-035-10	03/00
PG&E Corp. (CA)	CPUC 99-11-003	04/00
Qwest Gas Company	PSCU 99-057-10	08/00
U.S. West Communications (AZ)	ACC T-0151B-99-01505	09/00
PG&E Corp. (CA)	CPUC 00-05-013	09/00
San Diego Gas & Electric	CPUC 00-03-062	10/00
Southwest Gas (AZ)	G-01551A-00-0309	07/01

(a) Testimony filed, case settled.

Water Companies: Capital structures

	<u>Debt</u>	<u>Preferred Stock</u>	<u>Common Equity</u>	<u>Total</u>
<u>Standard Edition of Value Line</u>				
American States Water	49.50 %	0.50 %	50.00 %	100.00 %
American Water Wks.	59.00	1.00	40.00	100.00
California Water Ser.	50.00	0.00	50.00	100.00
Philadelphia Suburban	52.50	0.00	47.50	100.00
Average	52.75 %	0.38 %	46.88 %	100.00 %
<u>Expanded Edition of Value Line</u>				
Connecticut Water Services	49.00 %	1.00 %	50.0 %	100.00 %
Middlesex Water	52.00	3.00	45.0	100.00
SJW Corp.	38.00	0.00	62.0	100.00
Southwest Water Company	51.00	1.00	48.0	100.00
Average	47.50 %	1.25 %	51.25 %	100.00 %

Source: *Value Line*, May 4, 2001 and February 2, 2001;

Note: Companies in Standard Edition as of the end of 2001;
Companies in Expanded Edition as of 9/30/00.

DCF Analysis: Water Utilities

<u>Company</u>	<u>Current Dividend</u>	<u>Average Price Mar-May</u>	<u>Retention Growth (%)</u>	<u>Projected Dividend</u>	<u>Projected Yield (%)</u>	<u>Projected Return on Equity (%)</u>
American Water Works	\$0.94	\$31.200	6.97	\$1.01	3.22	10.20
American States Water	1.30	30.000	4.87	1.36	4.54	9.42
California Water Service	1.12	26.300	6.20	1.19	4.51	10.71
Philadelphia Suburban	0.62	22.860	6.53	0.66	2.89	9.42
Average	\$0.99	\$27.590	6.15	\$1.05	3.79	9.94

<u>Company</u>	<u>Current Dividend</u>	<u>Average Price Mar-May</u>	<u>Value Line Div. Growth (%)</u>	<u>Projected Dividend</u>	<u>Projected Yield (%)</u>	<u>Projected Return on Equity (%)</u>
American Water Works	\$0.94	\$31.200	4.50	\$0.98	3.15	7.65
American States Water	1.30	30.000	1.50	1.32	4.40	5.90
California Water Service	1.12	26.300	1.50	1.13	4.31	5.81
Philadelphia Suburban	0.62	22.860	4.50	0.65	2.83	7.33
Average	\$0.99	\$27.590	3.00	\$1.02	3.67	6.67

<u>Company</u>	<u>Current Dividend</u>	<u>Average Price Mar-May</u>	<u>Value Line Earn. Growth (%)</u>	<u>Projected Dividend</u>	<u>Projected Yield (%)</u>	<u>Projected Return on Equity (%)</u>
American Water Works	\$0.94	\$31.200	9.00	\$1.02	3.28	12.28
American States Water	1.30	30.000	6.00	1.38	4.59	10.59
California Water Service	1.12	26.300	6.00	1.18	4.50	10.50
Philadelphia Suburban	0.62	22.860	6.50	0.66	2.89	9.39
Average	\$0.99	\$27.590	6.88	\$1.06	3.82	10.69

DCF Analysis: Water Utilities

<u>Company</u>	<u>Current Dividend</u>	<u>Price 05/31/01</u>	<u>Retention Growth (%)</u>	<u>Projected Dividend</u>	<u>Projected Yield (%)</u>	<u>Projected Return on Equity (%)</u>
American Water Works	\$0.94	\$30.400	6.97	\$1.01	3.31	10.28
American States Water	1.30	30.700	4.87	1.36	4.44	9.32
California Water Service	1.12	24.750	6.20	1.19	4.79	10.99
Philadelphia Suburban	0.62	22.820	6.53	0.66	2.89	9.43
Average	\$0.99	\$27.168	6.15	\$1.05	3.86	10.00

<u>Company</u>	<u>Current Dividend</u>	<u>Price 05/31/01</u>	<u>Value Line Div. Growth (%)</u>	<u>Projected Dividend</u>	<u>Projected Yield (%)</u>	<u>Projected Return on Equity (%)</u>
American Water Works	\$0.94	\$30.400	4.50	\$0.98	3.23	7.73
American States Water	1.30	30.700	1.50	1.32	4.30	5.80
California Water Service	1.12	24.750	1.50	1.13	4.58	6.08
Philadelphia Suburban	0.62	22.820	4.50	0.65	2.84	7.34
Average	\$0.99	\$27.168	3.00	\$1.02	3.74	6.74

<u>Company</u>	<u>Current Dividend</u>	<u>Price 05/31/01</u>	<u>Value Line Earn. Growth (%)</u>	<u>Projected Dividend</u>	<u>Projected Yield (%)</u>	<u>Return on Equity (%)</u>
American Water Works	0.94	30.400	9.00	1.02	3.37	12.37
American States Water	1.30	30.700	6.00	1.38	4.49	10.49
California Water Service	1.12	24.750	6.00	1.18	4.78	10.78
Philadelphia Suburban	0.62	22.820	6.50	0.66	2.89	9.39
Average	\$0.99	\$27.168	6.88	\$1.06	3.88	10.76

Water Companies: Risk Indicators

	<u>Beta</u>	<u>Safety Rank</u>	<u>Financial Strength</u>	<u>Price Stabiliby</u>
<u>Standard Edition of Value Line</u>				
American States Water	0.65	3.00	B+	85
American Water Wks.	0.55	1.00	A	95
California Water Ser.	0.65	2.00	A	75
Philadelphia Suburban	0.60	2.00	B+	80
Average	0.61	2.00	B+/A	84

Source: *Value Line*, May 4, 2001.

Water Companies: Projected Growth Rates

Year end Reports for:	Projected Dividends Per Share	Projected Earnings Per Share	Projected Return on Common Equity (%)	Retention Growth Rate (%)	Value- Line Dividend Forecast (%)	Value- Line Earnings Forecast (%)	Beta
1988	\$1.41	\$2.48	13.5	6.04	6.2	5.9	0.75
1989	1.42	2.37	13.9	5.77	5.0	5.4	0.69
1990	1.43	2.07	12.8	4.11	4.4	4.5	0.69
1991	1.45	2.14	12.5	4.19	4.0	5.6	0.73
1992	1.49	2.20	12.7	4.26	5.6	6.8	0.68
1993	1.48	2.12	11.5	3.62	3.3	5.4	0.60
1994	1.53	2.18	12.0	3.73	3.3	6.0	0.63
1995	1.61	2.17	11.8	3.17	3.8	4.8	0.63
1996	1.48	1.94	12.8	3.15	5.1	6.1	0.58
1997	1.52	2.14	11.3	3.42	4.4	7.3	0.59
1998	1.31	1.94	12.0	4.06	4.8	8.0	0.60

Source: *Value Line*.

Note: Retention Rate = 1 - Dividends/Earnings
Growth Rate = Retention Rate x (Return on Equity + 0.5%).
Return on equity increased by 0.5% to reflect conversion from
year-end to average year basis.

Water Companies: Historical DCF Analysis

<u>Year</u>	<u>Price</u>	<u>Projected Dividend</u>	<u>Projected Yield</u>	<u>Retention Growth Rate</u>	<u>Expected Return</u>
1989	20.38	1.18	5.78	6.04	11.82
1990	19.75	1.26	6.37	5.77	12.14
1991	16.82	1.27	7.55	4.11	11.66
1992	21.50	1.27	5.91	4.19	10.10
1993	22.31	1.30	5.84	4.26	10.10
1994	24.48	1.33	5.42	3.62	9.04
1995	21.81	1.36	6.23	3.73	9.96
1996	24.69	1.13	4.60	3.17	7.77
1997	23.98	1.05	4.39	3.15	7.54
1998	31.66	1.00	3.17	3.42	6.59
1999	31.83	1.01	3.17	4.06	7.23

Source: Price is year-end closing price of previous year.
Projected dividend is declared dividend of previous year
times $(1 + \text{growth rate})$.

Water Companies: Historical DCF Analysis

<u>Year</u>	<u>Price</u>	<u>Projected Dividend</u>	<u>Projected Yield</u>	<u>Projected Dividend Growth Rate</u>	<u>Expected Return</u>
1989	\$20.375	\$1.18	5.79 %	6.2 %	11.99 %
1990	19.750	1.25	6.33	5.0	11.33
1991	16.821	1.27	7.57	4.4	11.97
1992	21.500	1.27	5.90	4.0	9.90
1993	22.313	1.32	5.92	5.6	11.52
1994	24.479	1.32	5.40	3.3	8.70
1995	21.813	1.35	6.20	3.3	9.50
1996	24.688	1.14	4.62	3.8	8.42
1997	23.979	1.07	4.47	5.1	9.57
1998	31.656	1.01	3.20	4.4	7.60
1999	31.833	1.02	3.19	4.8	7.99

Source: Price is year-end closing price of previous year.

Projected dividend is declared dividend of previous year
times (1 + growth rate).

Water Companies: Historical DCF Analysis

<u>Year</u>	<u>Price</u>	<u>Projected Dividend</u>	<u>Projected Yield</u>	<u>Projected Earnings Growth Rate</u>	<u>Expected Return</u>
1989	\$20.375	\$1.18	5.77 %	5.9 %	11.67 %
1990	19.750	1.25	6.35	5.4	11.75
1991	16.821	1.27	7.58	4.5	12.08
1992	21.500	1.29	5.99	5.6	11.59
1993	22.313	1.34	5.98	6.8	12.78
1994	24.479	1.35	5.51	5.4	10.91
1995	21.813	1.39	6.37	6.0	12.37
1996	24.688	1.15	4.67	4.8	9.47
1997	23.979	1.08	4.51	6.1	10.61
1998	31.656	1.04	3.29	7.3	10.59
1999	31.833	1.05	3.29	8.0	11.29

Source: Price is year-end closing price of previous year.

Projected dividend is declared dividend of previous year
times (1 + growth rate).

Water Companies: CAPM Returns

<u>Year</u>	<u>Risk-Free Rate</u>	<u>Beta</u>	<u>Market Risk Premium</u>	<u>Required Return</u>
1989	9.01 %	0.75	7.41 %	14.57 %
1990	7.90	0.69	7.50	13.08
1991	8.24	0.69	7.24	13.24
1992	7.50	0.73	7.30	12.83
1993	7.43	0.68	7.19	12.32
1994	6.25	0.60	6.96	10.43
1995	7.87	0.63	6.96	12.25
1996	6.06	0.63	6.97	10.45
1997	6.55	0.58	7.21	10.73
1998	5.99	0.59	7.36	10.33
1999	5.06	0.60	8.00	9.86

Source: Risk-free rate from FFederal Reserve Bulletin; beta is from Schedule 9;
market risk premium is from Ibbotson and Associates.

Water Companies: Expected Risk Premiums, 1989-1999

<u>Year</u>	<u>Average Expected Return on Stock</u>	<u>Bond Yield</u>		<u>Risk Premium Based on:</u>	
		<u>30-Year Treasury Bonds</u>	<u>Single-A Utility Bond Rate</u>	<u>On Treasury Rate</u>	<u>On Utility Rate</u>
1989	11.82 %	9.01 %	9.90 %	2.81 %	1.92 %
1990	12.14	7.90	9.26	4.24	2.88
1991	11.66	8.24	9.42	3.42	2.24
1992	10.10	7.50	8.71	2.60	1.39
1993	10.10	7.43	8.32	2.67	1.78
1994	9.04	6.25	7.18	2.79	1.86
1995	9.96	7.87	8.69	2.09	1.27
1996	7.77	6.06	7.03	1.71	0.74
1997	7.54	6.55	7.44	0.99	0.10
1998	6.59	5.99	7.17	0.60	-0.58
1999	7.23	5.06	6.78	2.17	0.45
Average				2.37 %	1.28 %
Excluding Negative Val.				2.37 %	1.46 %

Source: Expected returns from Schedule 6 , page 1 of 4.
30 year Government Bond Yields, *Federal Reserve Bulletin*.
Utility Bond Yields, *Moody's Public Utility Manuals and
Bond Survey*.

Water Companies: Expected Risk Premiums, 1989-1999

<u>Year</u>	<u>Average Expected Return on Stock</u>	<u>Bond Yield</u>		<u>Risk Premium Based on:</u>	
		<u>30-Year Treasury Bonds</u>	<u>Single-A Utility Bond Rate</u>	<u>On Treasury Rate</u>	<u>On Utility Rate</u>
1989	11.99 %	9.01 %	9.90 %	2.98 %	2.09 %
1990	11.33	7.90	9.26	3.43	2.07
1991	11.97	8.24	9.42	3.73	2.55
1992	9.90	7.50	8.71	2.40	1.19
1993	11.52	7.43	8.32	4.09	3.20
1994	8.70	6.25	7.18	2.45	1.52
1995	9.50	7.87	8.69	1.63	0.81
1996	8.42	6.06	7.03	2.36	1.39
1997	9.57	6.55	7.44	3.02	2.13
1998	7.60	5.99	7.17	1.61	0.43
1999	7.99	5.06	6.78	2.93	1.21
Average				2.78 %	1.69 %

Source: Expected returns from Schedule 6 , page 2 of 4.
30 year Government Bond Yields, *Federal Reserve Bulletin*.
Utility Bond Yields, *Moody's Public Utility Manuals* and
Bond Survey.

Water Companies: Expected Risk Premiums, 1989-1999

Year	Average Expected Return on Stock	Bond Yield		Risk Premium Based on:	
		30-Year Treasury Bonds	Single-A Utility Bond Rate	On Treasury Rate	On Utility Rate
1989	11.67 %	9.01 %	9.90 %	2.66 %	1.77 %
1990	11.75	7.90	9.26	3.85	2.49
1991	12.08	8.24	9.42	3.84	2.66
1992	11.59	7.50	8.71	4.09	2.88
1993	12.78	7.43	8.32	5.35	4.46
1994	10.91	6.25	7.18	4.66	3.73
1995	12.37	7.87	8.69	4.50	3.68
1996	9.47	6.06	7.03	3.41	2.44
1997	10.61	6.55	7.44	4.06	3.17
1998	10.59	5.99	7.17	4.60	3.42
1999	11.29	5.06	6.78	6.23	4.51
Average				4.30 %	3.20 %

Source: Expected returns from Schedule 6 , page 3 of 4.
30 year Government Bond Yields, *Federal Reserve Bulletin*.
Utility Bond Yields, *Moody's Public Utility Manuals and Bond Survey*.

Water Companies: Expected Risk Premiums, 1989-1999

Year	Average Expected Return on Stock	Bond Yield		Risk Premium Based on:	
		30-Year Treasury Bonds	Single-A Utility Bond Rate	On Treasury Rate	On Utility Rate
1989	14.57 %	9.01 %	9.90 %	5.56 %	4.67 %
1990	13.08	7.90	9.26	5.18	3.82
1991	13.24	8.24	9.42	5.00	3.82
1992	12.83	7.50	8.71	5.33	4.12
1993	12.32	7.43	8.32	4.89	4.00
1994	10.43	6.25	7.18	4.18	3.25
1995	12.25	7.87	8.69	4.38	3.56
1996	10.45	6.06	7.03	4.39	3.42
1997	10.73	6.55	7.44	4.18	3.29
1998	10.33	5.99	7.17	4.34	3.16
1999	9.86	5.06	6.78	4.80	3.08
Average				4.75 %	3.65 %

Source: Expected returns from Schedule 7 , page 4 of 4.
30 year Government Bond Yields, *Federal Reserve Bulletin*.
Utility Bond Yields, *Moody's Public Utility Manuals* and
Bond Survey.

Moody's Public Utility Bond Yields

<u>Year</u>	<u>Aaa</u>	<u>Aa</u>	<u>A</u>	<u>Baa</u>
1968	6.22 %	6.35 %	6.51 %	6.87 %
1969	7.12	7.34	7.54	7.93
1970	8.31	8.52	8.69	9.18
1971	7.72	8.00	8.16	8.63
1972	7.46	7.60	7.72	8.17
1973	7.60	7.72	7.84	8.17
1974	8.71	9.04	9.50	9.84
1975	9.03	9.44	10.09	10.96
1976	8.63	8.92	9.29	9.82
1977	8.19	8.43	8.61	9.06
1978	8.87	9.10	9.29	9.62
1979	9.87	10.23	10.49	10.97
1980	12.30	13.00	13.34	13.95
1981	14.64	15.30	15.95	16.54
1982:				
January	15.79	16.48	16.83	17.83
February	15.88	16.33	16.84	17.83
March	15.05	15.57	16.50	17.16
April	14.86	15.12	16.31	17.00
May	14.68	15.01	16.04	16.68
June	15.32	15.78	16.42	17.21
July	14.96	15.67	16.42	17.09
August	13.98	14.71	15.83	16.37
September	13.24	13.92	15.40	15.68
October	12.42	13.21	14.79	15.10
November	12.11	12.92	14.46	14.81
December	12.32	12.76	14.43	14.69
1983:				
January	12.29	12.74	14.24	14.56
February	12.48	13.02	14.26	14.61
March	12.19	12.67	13.94	14.33
April	12.00	12.43	13.61	14.07
May	12.01	12.44	13.50	14.05
June	12.23	12.64	13.64	14.16
July	12.69	12.86	13.58	14.01
August	13.04	13.18	13.57	14.21
September	12.85	13.04	13.42	14.10
October	12.66	12.88	13.25	13.95
November	12.82	12.97	13.38	14.12
December	13.00	13.14	13.52	14.23

Moody's Public Utility Bond Yields

<u>Year</u>	<u>Aaa</u>	<u>Aa</u>	<u>A</u>	<u>Baa</u>
1984:				
January		13.02 %	13.39 %	14.05 %
February		13.04	13.41	14.05
March		13.66	13.87	14.56
April		13.93	14.16	14.82
May		14.66	14.90	15.28
June		14.90	15.09	15.50
July		14.42	14.82	15.50
August		13.67	14.43	14.79
September		13.43	14.17	14.51
October	13.00	13.38	13.80	14.17
November	12.66	13.00	13.23	13.72
December	12.49	12.76	13.11	13.46
1985:				
January	12.47	12.68	12.99	13.36
February	12.61	12.87	13.08	13.44
March	13.08	13.50	13.87	14.19
April	12.77	13.17	13.61	14.11
May	12.18	12.65	13.12	13.62
June	11.17	11.68	12.13	12.66
July	11.18	11.55	12.07	12.70
August	11.23	11.65	12.13	12.73
September	11.27	11.68	12.13	12.72
October	11.23	11.61	12.01	12.52
November	10.71	11.10	11.49	12.04
December	10.24	10.57	10.97	11.48
1986:				
January	10.14	10.44	10.79	11.24
February	9.65	9.98	10.26	10.74
March	8.75	9.16	9.48	9.91
April	8.45	8.87	9.14	9.63
May	9.07	9.38	9.59	10.02
June	9.02	9.36	9.62	10.03
July	8.66	9.05	9.37	9.69
August	8.59	9.03	9.29	9.70
September	8.91	9.28	9.52	9.96
October	8.84	9.24	9.52	9.95
November	8.59	9.01	9.28	9.69
December	8.41	8.81	9.12	9.49

Moody's Public Utility Bond Yields

<u>Year</u>	<u>Aaa</u>	<u>Aa</u>	<u>A</u>	<u>Baa</u>
1987:				
January	8.23 %	8.62 %	8.95 %	9.27 %
February	8.29	8.69	9.00	9.24
March	8.21	8.64	8.93	9.19
April	8.83	9.15	9.38	9.85
May	9.34	9.63	9.91	10.40
June	9.37	9.61	10.02	10.46
July	9.56	9.70	10.13	10.62
August	9.92	10.05	10.45	10.90
September	10.53	10.66	11.22	11.58
October	10.92	11.11	11.34	11.91
November	10.43	10.62	10.82	11.40
December	10.64	10.78	10.98	11.55
1988:				
January	10.39	10.52	10.76	11.34
February	9.77	9.91	10.10	10.65
March	9.72	9.92	10.09	10.69
April	10.07	10.29	10.54	11.23
May	10.29	10.53	10.81	11.38
June	10.27	10.52	10.79	11.27
July	10.50	10.76	11.04	11.52
August	10.66	10.85	11.17	11.69
September	10.15	10.34	10.61	11.13
October	9.62	9.79	9.97	10.31
November	9.52	9.80	9.90	10.35
December	9.67	9.90	10.06	10.44
1989:				
January	9.72	9.89	10.08	10.38
February	9.71	9.93	10.07	10.38
March	9.87	10.05	10.23	10.50
April	9.88	10.02	10.18	10.49
May	9.60	9.79	9.99	10.29
June	9.13	9.37	9.64	9.80
July	8.98	9.23	9.50	9.64
August	9.02	9.27	9.52	9.64
September	9.10	9.35	9.58	9.70
October	9.01	9.28	9.54	9.64
November	8.92	9.25	9.51	9.64
December	8.92	9.26	9.44	9.60

Moody's Public Utility Bond Yields

<u>Year</u>	<u>Aaa</u>	<u>Aa</u>	<u>A</u>	<u>Baa</u>
1990:				
January	9.08	9.39	9.56	9.74
February	9.35	9.59	9.76	9.96
March	9.48	9.60	9.85	10.06
April	9.60	9.81	9.92	10.13
May	9.58	9.83	10.00	10.16
June	9.38	9.60	9.80	9.96
July	9.36	9.61	9.75	9.92
August	9.54	9.78	9.92	10.12
September	9.73	9.87	10.12	10.32
October	9.66	9.77	10.05	10.28
November	9.43	9.59	9.90	10.12
December	9.18	9.42	9.73	9.96
1991:				
January	9.17	9.39	9.71	9.96
February	8.92	9.16	9.47	9.68
March	9.04	9.23	9.55	9.74
April	8.95	9.14	9.46	9.64
May	8.93	9.16	9.44	9.64
June	9.10	9.28	9.59	9.79
July	9.10	9.26	9.55	9.69
August	8.81	9.06	9.29	9.47
September	8.65	8.95	9.16	9.34
October	8.57	8.92	9.12	9.32
November	8.52	8.87	9.05	9.28
December	8.38	8.71	8.88	9.07
1992:				
January	8.22	8.63	8.84	8.98
February	8.30	8.76	8.93	9.09
March	8.39	8.82	8.97	9.16
April	8.36	8.76	8.93	9.11
May	8.32	8.69	8.87	9.01
June	8.26	8.63	8.78	8.90
July	8.12	8.45	8.57	8.69
August	8.04	8.30	8.44	8.58
September	8.04	8.28	8.40	8.54
October	8.06	8.42	8.54	8.76
November	8.11	8.51	8.63	8.86
December	8.01	8.32	8.43	8.69

Moody's Public Utility Bond Yields

Year	Aaa	Aa	A	Baa
1993:				
January	7.94	8.14	8.27	8.57
February	7.75	7.92	8.04	8.31
March	7.64	7.76	7.90	8.10
April	7.50	7.64	7.81	8.11
May	7.44	7.64	7.86	8.18
June	7.37	7.54	7.75	8.05
July	7.25	7.38	7.54	7.93
August	6.94	7.07	7.25	7.59
September	6.76	6.89	7.04	7.35
October	6.75	6.89	7.03	7.27
November	7.06	7.17	7.30	7.69
December	7.06	7.18	7.34	7.73
1994:				
January	7.05	7.18	7.33	7.66
February	7.19	7.34	7.42	7.76
March	7.60	7.74	7.85	8.11
April	8.00	8.12	8.22	8.47
May	8.11	8.24	8.33	8.61
June	8.07	8.21	8.31	8.64
July	8.21	8.38	8.47	8.80
August	8.15	8.32	8.41	8.74
September	8.41	8.56	8.64	8.98
October	8.65	8.78	8.86	9.24
November	8.77	8.90	8.98	9.35
December	8.55	8.69	8.76	9.16
1995:				
January	8.53	8.66	8.73	9.15
February	8.33	8.45	8.52	8.93
March	8.18	8.29	8.37	8.78
April	8.08	8.17	8.27	8.67
May	7.17	7.80	7.91	8.30
June	7.39	7.49	7.60	8.01
July	7.51	7.60	7.70	8.11
August	7.66	7.71	7.83	8.24
September	7.42	7.48	7.62	7.98
October	7.23	7.30	7.46	7.82
November	7.13	7.22	7.43	7.81
December	6.94	7.03	7.23	7.63
1996:				
January	6.92	7.02	7.22	7.64
February	7.11	7.20	7.37	7.78
March	7.45	7.55	7.73	8.15
April	7.60	7.70	7.89	8.32
May	7.73	7.79	7.98	8.45
June	7.83	7.87	8.06	8.51
July	7.78	7.83	8.02	8.44
August	7.59	7.66	7.84	8.25
September	7.76	7.84	8.01	8.41
October	7.50	7.60	7.77	8.15
November	7.21	7.32	7.49	7.87
December	7.33	7.44	7.59	7.98

Moody's Public Utility Bond Yields

<u>Year</u>	<u>Aaa</u>	<u>Aa</u>	<u>A</u>	<u>Baa</u>
1997:				
January	7.53	7.68	7.77	8.18
February	7.47	7.60	7.64	8.02
March	7.70	7.84	7.87	8.26
April	7.88	8.00	8.03	8.42
May	7.72	7.85	7.89	8.28
June	7.55	7.68	7.72	8.12
July	7.29	7.43	7.48	7.87
August	7.39	7.46	7.51	7.92
September	7.33	7.43	7.47	7.79
October	7.18	7.28	7.35	7.67
November	7.09	7.15	7.25	7.49
December	6.99	7.07	7.16	7.41
1998:				
January	6.85	6.94	7.04	7.28
February	6.91	6.99	7.12	7.36
March	6.96	7.04	7.16	7.37
April	6.94	7.02	7.16	7.37
May	6.94	7.06	7.16	7.34
June	6.80	6.91	7.03	7.21
July	6.80	6.91	7.03	7.23
August	6.75	6.87	7.00	7.20
September	6.66	6.78	6.93	7.13
October	6.63	6.79	6.96	7.13
November	6.59	6.89	7.03	7.31
December	6.43	6.78	6.91	7.24
1999:				
January	6.41	6.82	6.97	7.30
February	6.56	6.94	7.09	7.41
March	6.78	7.11	7.26	7.55
April	6.80	7.11	7.22	7.51
May	7.09	7.38	7.47	7.74
June	7.37	7.67	7.74	8.03
July	7.34	7.62	7.71	7.97
August	7.54	7.82	7.91	8.16
September	7.55	7.82	7.93	8.19
October	7.73	7.96	8.06	8.32
November	7.56	7.82	7.94	8.12
December	7.74	8.00	8.14	8.28
2000:				
January	7.95	8.17	8.35	8.4
February	7.82	7.99	8.25	8.33
March	7.87	7.99	8.28	8.4
April	7.87	8	8.29	8.4
May	8.22	8.44	8.7	8.86
June	7.96	8.1	8.36	8.47
July	8	8.1	8.25	8.33
August	7.89	7.95	8.13	8.25
September	7.92	8.11	8.23	8.32
October	7.8	8.08	8.14	8.29
November	7.71	8.03	8.11	8.25
December	7.51	7.79	7.84	8.01
2001:				
January	7.53	7.73	7.8	7.99
February	7.46	7.62	7.74	7.94
March	7.31	7.51	7.68	7.85
April	7.53	7.72	7.94	8.06

Source: Moody's Public Utility Manuals and Mergent's Bond Record.

Water Companies: Value Line and S&P Betas

	<u>Value Line</u>	<u>S&P</u>
<u>Standard Edition of Value Line</u>		
American States Water	0.65	0.31
American Water Wks.	0.55	0.34
California Water Ser.	0.65	NA
Philadelphia Suburban	0.60	-0.22
Average	0.61	0.14
Average excl. neg. val.	0.61	0.33
<u>Expanded Edition of Value Line</u>		
Connecticut Water Services	0.45	-0.09
Middlesex Water	0.40	0.12
SJW Corp.	0.50	NA
Southwest Water Company	0.50	-0.26
Average	0.46	-0.08
Average excl. neg. val.	0.46	0.12

Source: *Value Line*, May 4, 2001 and February 2, 2001;
Standard & Poor's Corporation, *Stock Reports*, March 2001.

Water Companies: Projected Rates of Return

	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>
<u>Standard Edition of Value Line</u>				
American States Water	10.10 %	9.30 %	9.50 %	9.50 %
American Water Wks.	9.00	9.40	10.00	10.00
California Water Ser.	11.40	10.10	9.00	12.00
Philadelphia Suburban	12.30	11.70	13.50	13.50
 Average	 10.70 %	 10.13 %	 10.50 %	 11.25 %

Source: *Value Line*, May 4, 2001.

Weighted Average Cost of Capital

Based on consolidated capital structure of utilities, Inc., December 31, 2000

<u>Component</u>	<u>Ratios</u>	<u>Cost</u>	<u>Weighted Cost</u>
Long-term Debt	50.09 %	8.62 %	4.32 %
Common Equity	49.91	10.50	5.24
Total	100.00 %		9.56 %